

What is claimed is:

1. An absorbent composition comprising:
a water-swellable, water-insoluble absorbent material; and
a cooling compound, wherein the cooling compound has an endothermic effect,
wherein the absorbent composition exhibits an absorbent capacity of at least 10 grams
of 0.9 wt% NaCl saline per gram of the absorbent composition and a cooling effect of at
least a 2°C reduction in temperature of at least a portion of the absorbent composition.
2. The composition of claim 1, wherein the absorbent material is acidic, and
wherein the cooling compound is a basic compound capable of neutralizing the acidic
absorbent material.
3. The composition of claim 2, wherein the absorbent material has a pH
ranging from 1 to 6.5, and wherein the absorbent composition has a pH ranging from 4
to 6.5.
4. The composition of claim 1, wherein the absorbent material is basic, and
wherein the cooling compound is an acidic compound capable of neutralizing the basic
absorbent material.
5. The composition of claim 4, wherein the absorbent material has a pH
ranging from 7.5 to 13, and wherein the absorbent composition has a pH ranging from 4
to 6.5.
6. The composition of claim 1, wherein the absorbent material has a pH
ranging from 6 to 7.5, and wherein the absorbent composition has a pH ranging from 4
to 6.5.
7. The composition of claim 1, wherein the absorbent composition has a pH
ranging from 3 to 8.
8. The composition of claim 1, wherein the absorbent composition has a pH
ranging from 4 to 7.

9. The composition of claim 1, wherein the absorbent composition exhibits an absorbent capacity of at least 70 percent of the absorbent capacity of the absorbent material.

10. The composition of claim 1, wherein the absorbent composition exhibits an absorbent capacity of at least 90 percent of the absorbent capacity of the absorbent material.

11. The composition of claim 1, wherein the absorbent composition exhibits an absorbent capacity at least equal to the absorbent capacity of the absorbent material.

12. The composition of claim 1, wherein the cooling compound is chosen from the group consisting of: potassium chloride, sodium acetate trihydrate, ammonium nitrate, ammonium chloride, ammonium iodate, tetramethylammonium iodide, lithium perchlorate trihydrate, sodium cyanide dihydrate, sodium cyanate, potassium perchlorate, potassium nitrate, potassium iodide, potassium iodate, potassium permanganate, rubidium nitrate, rubidium iodide, cesium iodide, cesium chloride, cesium bromide, cesium perchlorate, cesium nitrate.

13. The composition of claim 1, wherein the cooling compound has an endothermic effect greater than 10 kJ/mol.

14. The composition of claim 1, wherein the cooling compound has an endothermic effect greater than 15 kJ/mol.

15. The composition of claim 1, wherein the cooling compound has an endothermic effect greater than 20 kJ/mol.

16. The composition of claim 1, wherein the absorbent material is a superabsorbent.

17. An absorbent composition comprising:
a water-swellaable, water-insoluble acidic absorbent material; and
a cooling compound, wherein the cooling compound has an endothermic effect
and is a basic compound capable of neutralizing the acidic absorbent material,
wherein the absorbent composition exhibits an absorbent capacity of at least 10 grams
of 0.9 wt% NaCl saline per gram of the absorbent composition and a cooling effect of at
least a 2°C reduction in temperature of at least a portion of the absorbent composition.

18. The composition of claim 17, wherein the absorbent material has a pH
ranging from 1 to 6.5, and wherein the absorbent composition has a pH ranging from 4
to 6.5.

19. The composition of claim 17, wherein the absorbent material is a
superabsorbent.

20. The composition of claim 17, wherein the absorbent composition has a
pH ranging from 3 to 8.

21. The composition of claim 17, wherein the absorbent composition has a
pH ranging from 4 to 7.

22. An absorbent composition comprising:
a water-swellaable, water-insoluble basic absorbent material; and
a cooling compound, wherein the cooling compound has an endothermic effect
and is an acidic compound capable of neutralizing the basic absorbent material,
wherein the absorbent composition exhibits an absorbent capacity of at least 10 grams
of 0.9 wt% NaCl saline per gram of the absorbent composition and a cooling effect of at
least a 2°C reduction in temperature of at least a portion of the absorbent composition.

23. The composition of claim 22, wherein the absorbent material has a pH
ranging from 7.5 to 13, and wherein the absorbent composition has a pH ranging from 4
to 6.5.

24. The composition of claim 22, wherein the absorbent material is a
superabsorbent.

25. The composition of claim 22, wherein the absorbent composition has a
pH ranging from 3 to 8.

26. The composition of claim 22, wherein the absorbent composition has a
pH ranging from 4 to 7.

27. A disposable absorbent product comprising a liquid-permeable topsheet, a liquid-impermeable backsheet attached to the topsheet, and an absorbent composition positioned between the topsheet and the backsheet, wherein the absorbent composition comprises:

a water-swellable, water-insoluble absorbent material; and
a cooling compound, wherein the cooling compound has an endothermic effect, wherein the absorbent composition exhibits an absorbent capacity of at least 10 grams of 0.9 wt% NaCl saline per gram of the absorbent composition and a cooling effect of at least a 2°C reduction in temperature of at least a portion of the absorbent composition.

28. The disposable absorbent product of claim 27, wherein the absorbent material has a pH ranging from 6 to 7.5, and wherein the absorbent composition has a pH ranging from 4 to 6.5.

29. The disposable absorbent product of claim 27, wherein the absorbent composition has a pH ranging from 3 to 8.

30. The disposable absorbent product of claim 27, wherein the absorbent composition has a pH ranging from 4 to 7.

31. The disposable absorbent product of claim 27, wherein the absorbent material is acidic, and wherein the cooling compound is a basic compound capable of neutralizing the acidic absorbent material.

32. The disposable absorbent product of claim 31, wherein the absorbent material has a pH ranging from 1 to 6.5, and wherein the absorbent composition has a pH ranging from 4 to 6.5.

33. The disposable absorbent product of claim 27, wherein the absorbent material is basic, and wherein the cooling compound is an acidic compound capable of neutralizing the basic absorbent material.

34. The disposable absorbent product of claim 33, wherein the absorbent material has a pH ranging from 7.5 to 13, and wherein the absorbent composition has a pH ranging from 4 to 6.5.

35. The disposable absorbent product of claim 27, further comprising:
a first portion including the absorbent composition; and
a second portion including a second absorbent material, such that the first portion has a net endothermic effect, and the second portion has a net exothermic hydration.

36. The disposable absorbent product of claim 27, wherein the absorbent composition exhibits an absorbent capacity of at least 70 percent of the absorbent capacity of the absorbent material.

37. The disposable absorbent product of claim 27, wherein the absorbent composition exhibits an absorbent capacity of at least 90 percent of the absorbent capacity of the absorbent material.

38. The disposable absorbent product of claim 27, wherein the absorbent composition exhibits an absorbent capacity at least equal to the absorbent capacity of the absorbent material.

39. The disposable absorbent product of claim 27, wherein the cooling compound is chosen from the group consisting of: potassium chloride, sodium acetate trihydrate, ammonium nitrate, ammonium chloride, ammonium iodate, tetramethylammonium iodide, lithium perchlorate trihydrate, sodium cyanide dihydrate, sodium cyanate, potassium perchlorate, potassium nitrate, potassium iodide, potassium iodate, potassium permanganate, rubidium nitrate, rubidium iodide, cesium iodide, cesium chloride, cesium bromide, cesium perchlorate, cesium nitrate.

40. The disposable absorbent product of claim 27, wherein the cooling compound has an endothermic effect greater than 10 kJ/mol.

41. The disposable absorbent product of claim 27, wherein the cooling compound has an endothermic effect greater than 15 kJ/mol.

42. The disposable absorbent product of claim 27, wherein the cooling compound has an endothermic effect greater than 20 kJ/mol.

43. The disposable absorbent product of claim 27, wherein the absorbent material is a superabsorbent.

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44. A method for producing an absorbent composition capable of exhibiting a cooling effect, the method comprising:

selecting a water-swellaable, water-insoluble absorbent material;

selecting a cooling compound having an endothermic effect; and

combining the absorbent material and the cooling compound to form the absorbent composition such that the absorbent composition exhibits an absorbent capacity of at least 10 grams of 0.9 wt% NaCl saline per gram of the absorbent composition and a cooling effect of at least a 2°C reduction in temperature of at least a portion of the absorbent composition.

45. The method of claim 44, further comprising incorporating the combination into a disposable absorbent product.

46. The method of claim 44, further comprising selling a disposable absorbent product incorporating the combination.

47. An absorbent composition comprising:
a superabsorbent material having an exothermic heat of hydration; and
a means for adapting the absorbent composition such that the absorbent composition has a net cooling effect in at least a portion of the composition while absorbing aqueous liquid, wherein the absorbent composition exhibits an absorbent capacity of at least 10 grams of 0.9 wt% NaCl saline per gram of the absorbent composition.

48. A method for inducing a response in a wearer of a disposable absorbent product, the method comprising:

absorbing a bodily fluid in the product, wherein the product contains an absorbent composition, and wherein the absorbent composition exhibits an absorbent capacity of at least 10 grams of 0.9 wt% NaCl saline per gram of the absorbent composition;

producing a reduction in the temperature of at least a portion of the product when the portion is exposed to the bodily fluid; and

positioning the portion adjacent to the wearer such that the wearer can feel the reduction in temperature.

49. The method of claim 48, further comprising enabling the wearer to recognize and respond to internal indicators to avoid the reduction in temperature.

50. The method of claim 48, wherein the reduction in the temperature of at least a portion of the product is at least a 2°C reduction.

51. A method for training a child, the method comprising:
providing a disposable absorbent product¹, wherein the product contains an absorbent composition, and wherein the absorbent composition exhibits an absorbent capacity of at least 10 grams of 0.9 wt% NaCl saline per gram of the absorbent composition; and
provoking the child to recognize urination by reducing the temperature of at least a portion of the product when the portion is exposed to urine.

52. The method of claim 51, wherein the reduction in the temperature of at least a portion of the product is at least a 2°C reduction.

53. An endothermic absorbent composition comprising:
a superabsorbent material; and
a cooling compound, wherein the endothermic absorbent composition is adapted to provide a cooling effect in at least a portion of the composition while absorbing aqueous liquid.

54. The composition of claim 53, wherein the superabsorbent material is acidic, and wherein the cooling compound is a basic compound capable of neutralizing the acidic superabsorbent material.

55. The composition of claim 54, wherein the superabsorbent material has a pH ranging from 1 to 6.5, and wherein the absorbent has a pH ranging from 4 to 6.5.

56. The composition of claim 53, wherein the absorbent material is basic, and wherein the cooling compound is an acidic compound capable of neutralizing the basic absorbent material.

57. The composition of claim 56, wherein the absorbent material has a pH ranging from 7.5 to 13, and wherein the absorbent has a pH ranging from 4 to 6.5.

58. The composition of claim 53, wherein the absorbent material has a pH ranging from 6 to 7.5, and wherein the absorbent composition has a pH ranging from 4 to 6.5.

59. The composition of claim 53, wherein the absorbent composition has a pH ranging from 3 to 8.

60. The composition of claim 53, wherein the absorbent composition has a pH ranging from 4 to 7.

61. The composition of claim 53, wherein the absorbent composition exhibits an absorbent capacity of at least 70 percent of the absorbent capacity of the absorbent material.

62. The composition of claim 53, wherein the absorbent composition exhibits an absorbent capacity of at least 90 percent of the absorbent capacity of the absorbent material.

63. The composition of claim 53, wherein the absorbent composition exhibits an absorbent capacity at least equal to the absorbent capacity of the absorbent material.

64. The composition of claim 53, wherein the cooling compound is chosen from the group consisting of: potassium chloride, sodium acetate trihydrate, ammonium nitrate, ammonium chloride, ammonium iodate, tetramethylammonium iodide, lithium perchlorate trihydrate, sodium cyanide dihydrate, sodium cyanate, potassium perchlorate, potassium nitrate, potassium iodide, potassium iodate, potassium permanganate, rubidium nitrate, rubidium iodide, cesium iodide, cesium chloride, cesium bromide, cesium perchlorate, cesium nitrate.

65. The composition of claim 53, wherein the cooling compound has an endothermic effect greater than 10 kJ/mol.

66. The composition of claim 53, wherein the cooling compound has an endothermic effect greater than 15 kJ/mol.

67. The composition of claim 53, wherein the cooling compound has an endothermic effect greater than 20 kJ/mol.

68. An absorbent composition comprising:
a superabsorbent material having an exothermic heat of hydration; and
a cooling compound having an endothermic effect, wherein the absorbent composition is adapted to provide a cooling effect in at least a portion of the composition while absorbing aqueous liquid.

69. The composition of claim 68, wherein the superabsorbent material is acidic, and wherein the cooling compound is a basic compound capable of neutralizing the acidic superabsorbent material.

70. The composition of claim 69, wherein the superabsorbent material has a pH ranging from 1 to 6.5, and wherein the absorbent has a pH ranging from 4 to 6.5.

71. The composition of claim 68, wherein the absorbent material is basic, and wherein the cooling compound is an acidic compound capable of neutralizing the basic absorbent material.

72. The composition of claim 71, wherein the absorbent material has a pH ranging from 7.5 to 13, and wherein the absorbent has a pH ranging from 4 to 6.5.

73. The composition of claim 68, wherein the absorbent material has a pH ranging from 6 to 7.5, and wherein the absorbent composition has a pH ranging from 4 to 6.5.

74. The composition of claim 68, wherein the absorbent composition has a pH ranging from 3 to 8.

75. The composition of claim 68, wherein the absorbent composition has a pH ranging from 4 to 7.

76. The composition of claim 68, wherein the absorbent composition exhibits an absorbent capacity of at least 70 percent of the absorbent capacity of the absorbent material.

77. The composition of claim 68, wherein the absorbent composition exhibits an absorbent capacity of at least 90 percent of the absorbent capacity of the absorbent material.

78. The composition of claim 68, wherein the absorbent composition exhibits an absorbent capacity at least equal to the absorbent capacity of the absorbent material.

79. The composition of claim 68, wherein the cooling compound is chosen from the group consisting of: potassium chloride, sodium acetate trihydrate, ammonium nitrate, ammonium chloride, ammonium iodate, tetramethylammonium iodide, lithium perchlorate trihydrate, sodium cyanide dihydrate, sodium cyanate, potassium perchlorate, potassium nitrate, potassium iodide, potassium iodate, potassium permanganate, rubidium nitrate, rubidium iodide, cesium iodide, cesium chloride, cesium bromide, cesium perchlorate, cesium nitrate.

80. The composition of claim 68, wherein the cooling compound has an endothermic effect greater than 10 kJ/mol.

81. The composition of claim 68, wherein the cooling compound has an endothermic effect greater than 15 kJ/mol.

82. The composition of claim 68, wherein the cooling compound has an endothermic effect greater than 20 kJ/mol.

83. An absorbent composition comprising:
a superabsorbent material; and
a sufficient amount of cooling compound such that the absorbent composition is adapted to provide a cooling effect in at least a portion of the composition while absorbing aqueous liquid.

84. The composition of claim 83, wherein the superabsorbent material is acidic, and wherein the cooling compound is a basic compound capable of neutralizing the acidic superabsorbent material.

85. The composition of claim 84, wherein the superabsorbent material has a pH ranging from 1 to 6.5, and wherein the absorbent has a pH ranging from 4 to 6.5.

86. The composition of claim 83, wherein the absorbent material is basic, and wherein the cooling compound is an acidic compound capable of neutralizing the basic absorbent material.

87. The composition of claim 86, wherein the absorbent material has a pH ranging from 7.5 to 13, and wherein the absorbent has a pH ranging from 4 to 6.5.

88. The composition of claim 83, wherein the absorbent material has a pH ranging from 6 to 7.5, and wherein the absorbent composition has a pH ranging from 4 to 6.5.

89. The composition of claim 83, wherein the absorbent composition has a pH ranging from 3 to 8.

90. The composition of claim 83, wherein the absorbent composition has a pH ranging from 4 to 7.

91. The composition of claim 83, wherein the absorbent composition exhibits an absorbent capacity of at least 70 percent of the absorbent capacity of the absorbent material.

92. The composition of claim 83, wherein the absorbent composition exhibits an absorbent capacity of at least 90 percent of the absorbent capacity of the absorbent material.

93. The composition of claim 83, wherein the absorbent composition exhibits an absorbent capacity at least equal to the absorbent capacity of the absorbent material.

94. The composition of claim 83, wherein the cooling compound is chosen from the group consisting of: potassium chloride, sodium acetate trihydrate, ammonium nitrate, ammonium chloride, ammonium iodate, tetramethylammonium iodide, lithium perchlorate trihydrate, sodium cyanide dihydrate, sodium cyanate, potassium perchlorate, potassium nitrate, potassium iodide, potassium iodate, potassium permanganate, rubidium nitrate, rubidium iodide, cesium iodide, cesium chloride, cesium bromide, cesium perchlorate, cesium nitrate.

95. The composition of claim 83, wherein the cooling compound has an endothermic effect greater than 10 kJ/mol.

96. The composition of claim 83, wherein the cooling compound has an endothermic effect greater than 15 kJ/mol.

97. The composition of claim 83, wherein the cooling compound has an endothermic effect greater than 20 kJ/mol.